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10/698,861	11/03/2003	Miguel Peeters	1875.3660001	9350

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EXAMINER
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TAYONG, HELENE E

ART UNIT	PAPER NUMBER
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2611

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08/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/698,861	PEETERS ET AL.
	Examiner Helene Tayong	Art Unit 2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) Responsive to communication(s) filed on 12 June 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-12 and 14-25 is/are rejected.
- 7) Claim(s) 13 and 26 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 11 March 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. This office action is in response to amendment filed on 6/12/07. Claims 1-26 objected to have been considered. Claims 1- 26 are pending in this application and have been considered below.

### ***Response to Arguments***

2. Applicants arguments regarding the rejection of claims 1-12 and 14-25 under 35 U.S.C. 102(e), as allegedly being anticipated by U.S. Published Patent Application No. 2003/0086486 (Graziano) have been fully considered but they are not persuasive. The examiner thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meets the claimed limitation as rejected.

**Applicant's arguments:** Graziano '486 publication fails to disclose or suggest "*adjusting at least one operating parameter of the communications system to maintain said virtual noise-to-signal ratio at a predetermined margin above a required noise-to-signal ratio*".

**The Examiner's response:** On page 12, [0237], Graziano '486 publication discloses a method in fig. 13 for selecting a filter, step 1316. As stated, the CPE may choose a filter that reduces transmit power in the low frequencies thereby lowering echo power, and in turn lowering its overall noise floor. It is further disclosed, in lines 14-17 that the CPE may lower its overall transmit power across some or all frequencies using power back off either alone or in addition to the high pass filtering. One of ordinary skill in the art would have considered lowering transmit power as a form of adjusting

parameters. Further more, as disclosed in [0239], lines 1-5, an end result of this filter selection method is to give a customer or other user extra noise margin, which may be defined as the amount of noise that may be added after the modems go to steady-state while maintaining an SNR above the minimum SNR. It would have been obvious to one of ordinary skill to consider the minimum SNR as taught by Graziano '486 publication as a *predetermined margin above a required noise-to-signal-ratio*.

Applicants are reminder that the Examiner is entitled to give the broadest reasonable interpretation to the language of the claim. So the Examiner considers "a certain minimum SNR" as "Virtual noise-to-signal ratio at a predetermined margin" and "transmit power" as " a parameter" within the broad meaning of the terms. The examiner is not limited to Applicant's definition, which is not specifically set forth in the claims. In re Tanaka et al., 193 USPQ 139, (CCPA) 1977.

3. Applicant's arguments, see Remarks, Rejection under 35 U.S.C. § 103, pages 14-15 file 6/12/07, with respect to claims 13 and 26 have been fully considered and are persuasive. The rejection of claims 13 and 26 under 35 U.S.C. 103(a), as allegedly unpatentable over the Graziano '486 publication in view of Steele, SNR Formula for Linear Delta Modulation with Band-Limited Flat and RC-Shaped Gaussian Signals, IEEE Transactions on Communications, Vol. COM-28 (December 1977)(the Steele publication), has been withdrawn.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-12 and 14-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Graziano et al.(US 2003/0086486 A1).

(1) with regards to claim 1:

selecting a first noise margin "m" ( **measuring a silence power spectrum**) Fig 1b, 126) relating to an external noise level present in the input communication signal;

selecting a second noise margin "mi" ( **echo signal**) ( fig 1b, 128) relating to an internal noise level generated by the communications system'

calculating a virtual noise-to-signal ratio (**SNR, the ratio of signal power to noise power**) ( fig 1b, 132) based on an external noise-to-signal ratio NSRe ( **P<sub>noise</sub>, power of noise only** ) (pg 8, [0180], line 3) , an internal noise-to-signal ratio NSRi' ( **P<sub>noise + signal</sub>, power of signal and noise** ) , said first noise margin (measuring a silence power), and said second noise margin ( echo signal)' and

adjusting at least one operating parameter of the communications system to maintain said virtual noise-to-signal ratio at a predetermined margin (**SNR<sub>min</sub>**, pg 6, [0132], lines 1-3) above a required noise-to-signal ratio. (step 238, figure 2, pg 5, [0134], lines 20-25)

(2) with regards to claim 2:

wherein said second noise margin "echo signal" is a predetermined function of said first noise margin ( pg. 5, [0130], [0131]).

(3) with regards to claim 3:

determining said external noise level (pg. 8, [ 0178, lines 7-10) ;  
determining said internal noise level ( pg 8, [ 0178], lines 5-7); and  
determining a total noise level based on said estimates of said external noise (fig 2, 226) level and said internal noise level (fig 2, 234; pg. 5, [0126], lines 1-16).

(4) with regards to claim 4:

wherein said step of determining said external noise level comprises the steps of (126, figure 1b):

providing a known periodic signal as the input communication signal (pg. 8, [0178], lines 1-5);  
performing a first noise power measurement with no output communication signal being generated (figure 1a, pg. 8, [ 0178], lines 7-10);  
performing a second noise power measurement while the communications system generates the output communication signal corresponding to said pseudo-random input signal (pg. 8, [0178], lines 5-7);

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providing a pseudo-random signal as the input communication signal (pg. 20, [0350], lines 1-2);

performing a third noise power measurement while the communications system generates the output communication signal corresponding to said pseudo-random input signal (pg. 20, [0351], lines 4-7);

determining said external noise level by subtracting a known receiver noise floor from said first noise power measurement ( pg. 15, [0271], lines 11-15), (pg. 20, [0354], lines 1-3); and

determining said internal noise level by subtracting the external noise level from said third noise power measurement ( pg. 15, [0271], lines 18-21).

(5) with regards to claim 5:

wherein said virtual noise-to-signal ratio is calculated as a sum of NSRe, and a product of:

(i) a ratio of the second noise margin to the first noise margin and (pg. 5, [0126], lines 1-16)

(ii) NSRi. (pg. 5, [0126], lines 1-16)

(6) with regards to claim 6:

wherein said predetermined margin above a required noise-to-signal ratio is equal to said first noise margin m. (pg. 10, [0200], lines 4-6)

(7) with regards to claim 7:

wherein said first noise margin is always greater than or equal to said second noise margin (pg. 10, [0200], lines 9-13)

(8) with regards to claim 8:

selecting a target margin corresponding to said first noise margin at an initial time; and (  $t_{crsc}$ , figure 1d, pg 5, [0125], lines 7-10)

selecting a target internal margin corresponding to said second noise margin at said initial time, (  $t_{crsr}$ , figure 1d, pg 5, [0125], lines 7-10)

wherein said target internal margin is a predetermined function of said target margin (  $t_{crsc}$ , figure 1d, pg 5, [0125], lines 7-10).

(9) with regards to claim 9:

wherein said first noise margin and said second noise margin are selected such that said first noise margin remains stable in the presence of one or more measurement errors (pg 11, [0225] ,(37)).

(10) with regards to claim 10:

wherein the communications system is a multiple carrier communications system having a plurality of carrier channels ( (G.SHDSL) pg. 4, [0118] ,lines 1-4).

(11) with regards to claim 11:

selecting said first and second noise margins for each said carrier channel (pg. 8, [0178], lines7-10); and adaptively equalizing said first and second noise margins across all of said carrier channels via real time adjustment of said at least one operating parameter ( pg. 15, [0272, lines 1-2, [0273], lines 6-9]..

(12) with regards to claim 12:

wherein said second noise margin is a function of a mean first noise margin for

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the plurality of carrier channels (pg. 14, [0262], lines 1-3).

(14) with regards to claim 14:

means for setting a first noise margin  $m$  relating to an external noise level present in the input communication signal (figure 1a, pg. 8, [ 0178]- lines 5-7]

means for setting a second noise margin  $m_i$  relating to an internal noise level generated by the communications system ( figure 1a, pg 8, [ 0178], lines 7-10)

means for calculating a virtual noise-to-signal ratio (**SNR, the ratio of signal power to noise power**) based on an external noise-to-signal ratio  $NSRe$ , an internal noise-to-signal ratio  $NSRi$ , said first noise margin, and said second noise margin; and (pg. 5, [ 0126], lines 1-16)

means for adjusting at least one operating parameter of the communications system to maintain said virtual noise-to-signal ratio at a predetermined margin (**SNR<sub>min</sub>**, pg 6, [0132], lines 1-3) above a required noise-to-signal ratio (step 238, figure 2, pg. 5, [0134], lines 20-25).

(15) with regards to claim 15:

wherein said means for setting said second noise margin establishes said second noise margin as a predetermined function of said first noise margin (pg. 5, [0130], [0131]).

(16) with regards to claim 16:

means for determining said external noise level (pg. 8, [ 0178, lines 7-10) ; means for determining said internal noise level ( pg. 8, [ 0178], lines 5-7); and means for determining a total noise level based on said estimates of

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said external noise level and said internal noise level (pg. 5, [0126], lines 1-16).

(17) with regards to claim 17:

wherein said means for determining said external noise level comprises:

means for providing a known periodic signal as the input communication signal (pg. 8, [0178], lines 7-10);

means for performing a first noise power measurement with no output communication signal being generated (figure 1a, pg. 8, [ 0178], lines 5-7);

means for performing a second noise power measurement while the communications system generates the output communication signal corresponding to said known periodic input signal (pg. 8, [0178-0181]);

means for providing a pseudo-random signal (ITU G.991.2) as the input communication signal (pg. 20,[0350, lines 1-2, [0351], lines 6-7);

means for performing a third noise power measurement while the communications system generates the output communications signal corresponding to said pseudo-random input signal (pg. 21, [0355], lies 1-6);

means for determining said external noise level by subtracting a known receiver noise floor from said first noise power measurement ( pg. 15, [0271], lines 11-15), (pg. 20, [0354, lines 1-3); and

means for determining said internal noise level by subtracting the external noise level from said third noise power measurement ( pg.15, [0271], lines 18-21).

(18) with regards to claim 18:

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wherein said means for calculating said virtual noise-to-signal ratio calculates said virtual noise-to-signal ratio as a sum of NSRe, and a product of:

- (i) a ratio of the second noise margin to the first noise margin (pg. 5, [0126], lines 1-16)  
and
- (ii) NSRi (pg. 5, [0126], lines 1-16).

(19) with regards to claim 19:

wherein said predetermined margin above a required noise-to-signal ratio is equal to said first noise margin m (pg. 10, [0200], lines 5-7).

(20) with regards to claim 20:

wherein said first noise margin is always greater than or equal to said second noise margin (pg. 10, [0200], lines 9-13)

(21) with regards to claim 21:

means for selecting a target margin corresponding to said first noise margin at an initial time (  $t_{crsc}$ , figure 1d, pg. 5, [0125], lines 7-9) ; and

means for selecting a target internal margin corresponding to said second noise margin at said initial time (  $t_{crsr}$ , figure 1d, pg. 5, [0125], lines 7-9),

wherein said target internal margin is a predetermined function of said target margin (  $t_{crsc}$ , figure 1d, pg. 5, [0125], lines 7-9).

(22) with regards to claim 22:

wherein said first noise margin and said second noise margin are set such that said first noise margin remains stable in the presence of one or more measurement errors (pg. 11, [0225] ,(37)).

(23) with regards to claim 23:

wherein the communications system is a multiple carrier communications system having a plurality of carrier channels ((G.SHDSL, HDSL.2), [0192], pg. 10, lines 1-2).

(24) with regards to claim 24:

means for selecting said first (figure 1a, pg. 8, [ 0178]- lines 5-7] and second noise margins ( pg.8, [ 0178], lines 5-7) for each said carrier channel ((G.SHDSL, HDSL.2), [0192], pg. 10, lines 1-2); and

means for adaptively equalizing said first and second noise margins across all of said carrier channels via real time adjustment of said at least one operating parameter (pg. 15, [0272, lines 1-2, [0273], lines 6-9).

(25) with regards to claim 25:

wherein said second noise margin is a function of a mean first noise margin of the plurality of carrier channels (pg. 14, [0262], lines 1-3).

#### ***Allowable Subject Matter***

6. Claims 13 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter the prior art Graziano et al.(US 2003/0086486 A1) and Steele (IEEE Transaction on Communications, vol.com 28, No. 12, Dec. 1980) do not teach setting (or means for setting) the second noise margin ( $m_i$ ), where  $m_i$  (and/or a formula for determining  $m_i$ )

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varies based on the value of m, according to one of three ranges

( $m \leq 1.5$ ;  $1.5 \leq m \leq m_{target}$ ; and  $m_{target} \leq m$  ).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene E. Tayong whose telephone number is (571) 270-1675. The examiner can normally be reached on Monday - Friday 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Liu Shuwang can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Helene Tayong

8/9/07



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SUPERVISORY PATENT EXAMINER